

REMARKS

In the May 22, 2003 Office Action, the Examiner noted that claims 1-17 were pending in the application; rejected claims 1-17 under the second paragraph of 35 U.S.C. § 112; rejected claims 1, 2 and 10-17 under 35 U.S.C. § 102(e); and rejected claims 3-9 under 35 U.S.C. § 103(a). In rejecting the claims, the U.S. Patents 5,761,496 to Hattori; 6,173,251 to Ito et al.; and 6,233,575 to Agrawal et al. (References A, I and C, respectively) were cited. This assumes that there was a typographical error on page 3, line 7 and that the last digit identifying the patent number of the reference used in the rejection under 35 U.S.C. § 102(e) should have been a 6 rather than an 8. The Examiner's rejections are traversed below.

The Invention

The present invention is directed to generating at least one of a hierarchical relation and an associative from a set of documents based on keywords, where the hierarchical and associative relations are [semantic relationships between keywords.] Such relations can be quite complex and can form a lattice, i.e., a multiple ancestor hierarchical relation. The associative relations are based on the occurrence frequency of each keyword. An existing synonym list is used to in defining an equivalent relation between keywords.

The Prior Art - U.S. Patent 5,761,496 to Hattori

The Hattori patent is directed to retrieval of information by detecting a keyword highly associated with an input keyword based on a hierarchical relation and degree of association previously created and indicated by a numerical value defined at column 11, lines 51-54.

Other Cited References

U.S. Patent 6,173,251 to Ito et al.

The Ito et al. patent is directed to extraction of keywords from a text using an existing synonym list to improve keyword extraction accuracy.

U.S. Patent 6,233,575 to Agrawal et al.

The Agrawal et al. patent is directed to classifying a set of documents into an existing taxonomy, i.e., a topic hierarchical relation.

Rejections under 35 U.S.C. § 112, Second Paragraph

In item 1 on page 2 of the Office Action, claims 1-17 were rejected under the second paragraph of 35 U.S.C. § 112. Amendments have been made in response to each of the comments in item 1. If any of the claims are believed to still be indefinite, the Examiner is respectfully requested to contact the undersigned by telephone to arrange an Examiner Interview to discuss how the claims can be amended to remove any remaining indefiniteness.

Rejections under 35 U.S.C. § 102(e)

In item 2 on pages 3-4 of the Office Action, claims 1, 2 and 10-17 were rejected under 35 U.S.C. § 102(e) as anticipated by Hattori. First, the meaning of terms used in the claims must be understood. As described on pages 1-12 of the application, a hierarchical relation between keywords is the type of structure used by directories of content available on the Internet. Although not mentioned in the application, a well-known example is the Yahoo! directory. The term "associative relation" represents a comparatively loose relation in which one keyword is associated with another keyword. The associative relation allows keywords that do not have a hierarchical relation to be correlated, as described at page 7, line 22 to page 8, line 1. Thus, an associative relation indicates that two keywords are associated "when these keywords have neither a hierarchical relation, nor an equivalent relation" (page 19, lines 11-12), where an equivalent relation is defined by "keywords included in a set of synonyms" (page 19, lines 7-8), i.e., keywords that represent equivalent concepts.

As discussed above, Hattori discloses an information retrieval system in which the relations between keywords have already been defined in what is termed "background knowledge" (e.g., column 11, line 29). One of the problems addressed by Hattori is that typically much better search results are obtained when a user understands the background knowledge used by the information retrieval system (see, e.g., column 1 and 2). As described at column 11, lines 30-60, the information that the system taught by Hattori starts with is illustrated in Fig. 3. "The background knowledge storage section 140 contains the conceptual hierarchy 310 of the attribute 1" (column 11, lines 41-43) which in the example is "fruit" having three terms lower in the hierarchy: "apple", "strawberry" and "pear". In addition, the background knowledge storage section contains an associative network 320 of attribute 2 which in the example is "price". The word "price" has an associative relation with the word "figure" that is assigned a relation value of 0.8 and in turn "figure" has been assigned relation values ranging between 0.4 and 0.6 to the words "fall", "cost", "fixed price" and "rise".

It is clearly stated in Hattori that the "user stores this type of associative network in the background knowledge storage section 140 for data attributes stored in the database 160" (column 14, lines 36-37). Two methods for calculating relation degrees between two words from relation degrees that have been assigned previously to all of the words is provided at the end of column 14 and first two-thirds of column 15. However, nothing has been cited or found in Hattori regarding how the original background knowledge is generated.

The independent claims have been amended to define hierarchical relation and associative relation as "representing relations between a first keyword included in a first hierarchical relation and a second keyword included in a second hierarchical relation" (e.g., claims 1, lines 5-6) and generating "directory information for accessing the group of documents by using the extracting relation as a link between the first and second keywords" (claim 1, lines 7-9). As discussed above, Hattori only discloses the accessing of documents, not the generation of directory information for the purpose of accessing the documents.

In addition, the term "association rule" as used in the claims and specification refers to the process illustrated in Figs. 10-15 and described at page 31, line 16 to page 38, line 8. The association rule "is extracted from pairs of a document and a set of keywords based on statistical information of a keyword pair" (page 32, lines 11-13). Thus, it is submitted that Hattori does not teach or suggest extraction of an "association rule" as that term is used in the application. Contrary to the statements in the last paragraph on page 3 of the Office Action, column 11, lines 30-60 of Hattori does not disclose extracting an association rule, but rather accessing the background knowledge storage section in which association rules have already been defined. Furthermore, it is submitted that column 14, line 30 to column 15, line 45 does not describe extracting an association rule, but rather calculating a value to be assigned between two words for which the association has already been defined.

For the reasons set forth above, it is submitted that independent claims 1 and 15-17, as well as claims 2 and 10-14 which depend from claim 1 patentably distinguish over Hattori. The difference between the present invention and Hattori is indicated by claim 13 which recites that a document organizing apparatus according to the invention comprises an addition element "to access the directory information" (claim 13, lines 2-3) so that a user can access "the group of documents through the directory information" (claim 13, lines 4-5). All that is taught by Hattori is a unit to access information by a user. The elements recited in claim 1 are not taught by Hattori.

Rejections under 35 U.S.C. § 103

In item 4 on pages 4-5 of the Office Action, claims 3-6 and 9 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hattori in view of Ito et al. First, it is noted that Ito et al. is not prior art, since its filing date of July 28, 1998 is over a month after the filing date of Japanese Patent Application 10-176749 which provides priority under 35 U.S.C. § 119, as acknowledged by the Examiner. Second, nothing has been cited or found in Ito et al. that would suggest modification of Hattori to overcome the deficiencies that have been previously noted. As discussed above, Ito et al. is directed to extraction of keywords, while the present invention starts with the keywords already extracted and generates directory information for accessing a group of documents. In other words, the present invention is directed to what occurs between what is taught by Ito et al. and what is taught by Hattori. Therefore, it is submitted that claims 3-6 and 9, all of which depend from claim 1, patentably distinguish over Hattori in view of Ito et al., even if the latter was prior art.

In item 5 on pages 5-6 of the Office Action, claims 7 and 8 were rejected under 35 U.S.C. § 103(a) as unpatentable over Hattori in view of Agrawal et al. First, it is noted that Agrawal et al. was filed the day before the Japanese patent application whose priority has been acknowledged. Therefore, none of the discussion below should be construed as an acknowledgement that Agrawal et al. is prior art.

Even if Agrawal et al. was prior art, nothing has been cited or found therein that would teach or suggest modification of Hattori to overcome the deficiencies previously noted. In fact, nothing was specifically cited in Agrawal et al. as relevant to the present invention. Since claims 7 and 8 depend from claim 1, it is submitted that claims 7 and 8 patentably distinguish over Hattori in view of Agrawal et al.

New Claim 18

Claim 18 has been added to recite the method for generating relations between keywords disclosed in the application as discussed above. The extraction operation recited in claim 18 produces "relations between the previously assigned keywords, including at least one of multiple ancestor hierarchical relations and associative relations based on statistical occurrence of the keywords" (claim 18, lines 5-7). As discussed above, there is no teaching or suggestion of such an operation in Hattori.

Summary

It is submitted that the references cited by the Examiner, even if they were all prior art, taken alone or in combination do not teach or suggest the features of the present claimed invention. Thus, it is submitted that claims 1-18 are in a condition suitable for allowance. Reconsideration of the claims and an early Notice of Allowance are earnestly solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on August 22, 20 03
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